DOCUMENT RESUME

ED 061 068 SE 013 408

TITLE The American Land. Its History, Soil, Water, Wildlife, Agricultural Land Planning, and Land Problems of Today and Tomorrow.

INSTITUTION Department of Agriculture Graduate School, Washington, D.C.; Soil Conservation Service (USDA), Washington, D.C.

PUB DATE 68

NOTE 44p.

EDRS PRICE MF-$0.65 HC-$3.29

DESCRIPTORS Instructional Materials; *Land Use; Natural Resources; *Scripts; Soil Science; *Televised Instruction

ABSTRACT

Presented in this booklet is the commentary for "The American Land," a television series prepared by the Soil Conservation Service and the Graduate School, United States Department of Agriculture, in cooperation with WETA - TV, Washington, D.C. It explores the resource of land in America, its history, soil, water, wildlife, agricultural land planning, and land problems of today and tomorrow. Following the text are related questions for discussion, a list of references for further reading, Soil Conservation Service publications, and a list of selected audio-visual aids. (BL)

ED 061068

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

THE AMERICAN LAND

Its

history

soil

water

wildlife

agricultural land planning, and

land problems of today and tomorrow.

Television series
prepared by the Soil Conservation Service
and the Graduate School, United States
Department of Agriculture, in
cooperation with WETA-TV, Washington, D.C.

SE 013 408

HISTORY -- THE THREE FACES OF AMERICA

> *The chief circumstance which has favoured the establishment and the maintenance of a democratic republic in the United States, is the nature of the territory which the Americans inhabit. Their ancestors gave them the love of equality and freedom; but God himself gave them the means of remaining free, by placing them upon a boundless continent, which is open to their exertions.*
>
> Alexis de Tocqueville

THE AMERICAN LAND

provides our food, living space, and much of our clothing, housing, and industrial materials. It also provides the solid base for our freedom.

For centuries, we had all the free land we wanted or needed -- a vast inland empire to absorb our people and their energies. "Go West, young man" was no idle exhortation. Young -- and older -- men and women, dissatisfied with life in the settled areas, were free to move West to build a new life on new land.

As our ancestors moved across the land, they changed it -- but the land also changed them. Its bounty gave them the power and well-being to become a great nation. Its vastness changed their attitudes and ambitions. Through their experiences as immigrants in a new physical environment, they grew away from the old ways of life in Europe, Africa, or Asia. They -- we -- became a new people. Americans, on the American land.

The changes we have made on the land reflect many of our national faults and virtues -- energy, greed, optimism, a willingness to learn and innovate.

Let us see what we have done to this "boundless continent . . . open to [our] exertions."

Let us look at the land -- and, therefore, at ourselves.

THE FIRST

or original, face of America was seen by early explorers and settlers. What they saw, along the Atlantic coast, was a forest so vast and magnificant as to be almost inconceivable today. It stretched from Maine to Florida and included most of the land from the coast to present-day Illinois. The forest covered the great mountain chains . the Green Mountains, Adirondacks, Poconos, Alleghenies, Appalachians. In the north, there were white pines, black spruce, and balsam fir. In the mid-Atlantic area, there were chestnuts, oaks, hickories, giving way, further South, to the slash, loblolly, and long-leaf pines, and cypress.

Much of the area was very productive. In 1584, one of Sir Walter Raleigh's men wrote: "We viewed the land about us, being whereas we first landed, very sandy and low towards the water's side, but so full of grapes as the beating and surge of the sea overflowed them, from which we found such a plenty, both on the sand and the green soil of the hills, that I think in all the world the like abundance is not to be found."

This was the first face of eastern America more than 300 years ago. But many used the land wastefully, with one-crop farming and little attention to replacement of nutrients in the soil. When the soil "wore out", it was a simple matter to move West. In 1789, George Washington, himself a careful farmer, complained in a letter, "Our lands were originally very good, but use and abuse have made them otherwise. We use the lands that are already cleared and then emigrate into the Western country."

Much of this land was wasted by poor planting methods. Corn, tobacco, and cotton were planted up and down the sloping soils, leaving the bare earth between open to water erosion. Early planters loved their land; not all of them understood it.

Today, the importance of good land use is more widely understood. And so, much of the Southeast is beautiful again. Grass, trees, contour plowing, cover crops, and other erosion-control methods when used with fertilizers, improved crop varieties and other modern management practices, are healing the gullies and bringing back new life.

Nothing, of course, can ever restore the original eastern forests. Today, the East is becoming crowded not with trees, but with people, cars, super-highways, and ever-expanding suburbs. Urbanization has reached its greatest intensity in the area from Boston to Northern Virginia. More than one out of every four Americans live in a state that fronts the Atlantic ocean.

MOVING WEST

as Americans are prone to do, we come to the prairies. This is the land of tall grass rooted in dark, rich soils . . . the greatest area of agriculturally useful land in the world.

For the first settlers, prairie soil was wealth, the source of life, and the primary fact of existence. They came by the thousands, plowed under the tall grass and prairie flowers and planted long, straight rows of corn. They were called sodbusters, because they did just that. When the sod was broken and the prairies opened to the wind and rain, rivers grew red and gold and brown with silt.

"The muddy Mississippi" they called it -- more than 425 million tons of silt and sediment carried out to the oceans of the world every year. The Missouri, they said, was "too thin to plow and too thick to drink", not quite comprehending it was their own good earth going out to sea.

The prairies are still beautiful, but they are no longer the land of Lincoln, nor even of our grandfathers. Part of that soil has washed and blown away. On what remains, we have built cities like Chicago, and prosperous farms that feed the world. We've learned many things about taking care of this country. We started late . . . but, we have started, and the land responds well to good care.

THE GREAT PLAINS

go from about the mid-Dakotas, Kansas and Nebraska, down to Texas and over to the Rocky Mountains. The many faces of the Plains puzzled and exhilarated the first homesteaders a hundred years ago.

These first settlers saw space, and grass, and vast amounts of both. Their space held less rain, and greater hazards than the prairies. It held harder winters, and colder blizzards, and hotter summers, and weeks of drought. It held cyclones and tornadoes; a wind that knifes in winter, blows dust and tumbleweeds in the dry summers and -- in the good summers -- ruffles the grainfields like a moving, golden ocean. In the bad years of the 1930's, the same driving wind turned the skies black and the Plains into a dust bowl. Farms in Oklahoma, ranches in Wyoming, wheatfields in North Dakota were stripped of their protective covering and damaged almost beyond repair.

WHAT HAPPENED?

An old story. Men broke the sod that the buffalo and wind had passed over lightly before. The drought years came and the crops failed. The winds lifted the exposed particles of soil and carried them for hundreds of miles. As the good soil disappeared, so too did the people, leaving behind their homes, hopes, possessions. This was human erosion; men and women of this century, humped and crippled and stripped of health and self-respect by their land. People caught in a time when the old frontier was 40 years gone and the new science of good land use was not yet widely accepted.

We ruin men, too, when we ruin the land.

TODAY,

men of the Plains are learning to live with nature, not against her. It took pain and hardship to understand this. The Plains will always have droughts, but another dust bowl does not have to occur.

BEYOND THE PLAINS

lie the mountains, the rangeland and desert, and the Pacific coast.

The mountains are sharp, rough hewn; the Rockies, the Sierra-Cascades, the coast ranges. They have oaks and pinyon pines, juniper and yellow pine, firs and spruces. Some of the most spectacular mountain and desert areas are now in national parks, such as Yellowstone, the Grand Canyon, Crater Lake, and Yosemite.

The western range is the land of cowmen and sheep herders. In the 1870's and 1880's, there was a great boom in the stock business and more and more livestock crowded the area. Native grasses were eaten to the roots and died. Willow trees along the stream banks were gnawed down to walking sticks. The land, stripped of covering, dried out, and sharp, sudden rains would rip the soil away because there was nothing to tie it down. The term "grassroots" took on a special meaning in the West.

When grass was eaten to the roots, herds and flocks were moved to new forage areas -- Kansas to Colorado, up to Wyoming, over to Utah, down to New Mexico. Overgrazing means too many animals on too little grass. The West was being overgrazed.

But still the trains from the East rolled in, bringing more men with money to invest in cow country. Take everything out. Put nothing back.

The hard winter of 1886 came and hundreds of thousands of cattle never lived to see the spring. Great stock companies collapsed. The grass to feed upon was going, the open range was going, the frontier was gone. "We have thronged upon this continent like demanding children," wrote one observer. "Now we must settle down and take care of our own, and live as sensible people should."

Today, the good ranges are fenced, and grazing rotated; stock-water ponds are built, salt blocks carefully placed, and the grass periodically checked for overgrazing.

Then, there are the desert and semiarid lands of the Southwest. Water was scarce there, and early settlements followed the rivers . . . the Colorado, Rio Grande, Brazos, Gila. Today, irrigation is essential to the production of crops in this area.

From the east coast to the West, in cities, suburbs, and on farmland, the American land has changed violently. It is still changing, for the better or the worse.

THE GREATEST LAND CHANGES

are caused by erosion.

Erosion is the wearing or washing away of soil and rocks by the action of wind or water. The Grand Canyon is a spectacular example of geologic, or natural erosion. Much more important, in terms of its effect on us, is the accelerated or manmade erosion caused by poor land management.

There are three general types of erosion -- sheet erosion, gully erosion and soil blowing, which is called wind erosion.

Whenever rain falls faster than it can soak into the soil, a sheet of water collects on the surface and moves downhill. The rain continues to dislodge soil and keeps it suspended in the moving sheet. The combined actions of beating rain and flowing water remove continuous layers of soil from fields. This is called sheet erosion.

On land where runoff is more concentrated, the fast flowing water will cut channels into the soil and feed large amounts of sediment into streams and reservoirs. These channels are cut so deep they cannot be smoothed out by ordinary cultivation. They sometimes divide fields into small areas impractical to cultivate. This is called gully erosion.

Soil blows when high winds come in contact with loose, unprotected soil. When blowing once starts, it tends to spread from field to field and farm to farm. Where a soil particle strikes bare ground it blasts loose other particles which, in turn, are swept across the ground surface and cause still further erosion. The blowing soil particles may cut off tender, growing plants at the ground surface. Or they may cover both growing and dead vegetation with drifts of dust or sand.

We must use the land, but we must use it intelligently and hold down the rate of manmade erosion. Some things that keep soil in place are trees and grass, contour plowing, stripcropping, windbreaks, cover crops, and terracing. In small watershed projects, farmers often use all these methods, as well as small dams, in a land treatment program.

THE FIRST FACE

of America is gone. The second face -- of hasty development -- is with us still. But the third face is emerging. This is the face that develops when men work with nature, through science; not to conquer or to tame the land, as though it were an inert mass, but to understand the living, changing soil, the climate, the waters of the land, the animals that live and the plants that grow, so that we may use them all wisely for our many needs. This third face is the face of healed scars and green fields; of tall grassland, clean streams, and wisely planned suburbs. It is the face of hope and promise for Americans and the American land.

THE LIVING SOIL

When the soil is gone, men must go, and the process does not take long.

Theodore Roosevelt

FROM THE ATLANTIC

to the Pacific, from Alaska to Hawaii, the United States contains about 2,300,000,000 acres of land and water. In the conterminous United States alone, there are not quite 2 billion acres. A sizable amount is in mountains, desert areas, and green forests. A smaller amount is in towns, cities, and low marshland. In between the highland, the lowland, the desert, and the cities, lies more than a billion acres of farms and ranches. Covering this land -- deserts, mountains, forests, cornfields -- is the soil.

SOIL IS

many things to many people. It's dirt to housewives, the raw material of their job to farmers and home builders, and the source of all food but seafood. It is, besides man's own intelligence, our greatest asset and the reason we remain alive.

Soil is also home to numerous micro-organisms that help to decompose the dead vegetable matter into materials for other plants to use. These micro-organisms are minute but important; an estimated quarter-million of average size could sit on this period.

The earth is also home to larger inhabitants like earthworms and larvae. When something new is added to the soil -- water for irrigation, chemical fertilizers, lime, and so on -- the large and small plants and animals are affected, and they in turn affect the ever-changing soil.

Most soil begins with minerals from a rock base, dead organic material, living organic materials such as tiny animals, water, soluble salts, and air.

The rock base is broken down through alternate heat and cold from sunshine, frost, and ice. When water turns into ice, it expands. So, when rocks are saturated with water, then frozen in cold weather and later heated by the sun, the rock surfaces will break into fragments.

Rocks also break down when their minerals are dissolved by water. Rainwater washes out some of the more soluble minerals, and the weakened rock begins to crumble. Wind blows in loose soil; weeds get a foothold in the crevices; more rock crumbles, more plants grow and die, and return to the ground to enrich the future soil.

This pattern of growth, decay, and enrichment repeats itself over and over for many thousands of years before a few inches of good surface soil is produced.

As soil-forming takes place, layers or horizons develop in the soil. These layers are called A horizon, B horizon, and C horizon. The A horizon, sometimes called surface soil, is generally the most productive part of the soil. It might be several inches to three feet thick -- most are less than 15 inches thick.

B horizon is the second layer, often called subsoil. This may have some organic material but is usually less productive than the A horizon.

The C horizon is the deepest of the three major horizons. The rock material in this horizon is the same kind as that which now forms the bulk of the soil above it.

Not all soils have a complete set of horizons. Some have an A-C horizon. These are often young soils. Others have a B-C horizon; their A horizon may have been removed by erosion or mixed with the B in plowing. On other soils, sediment from floodwaters may be deposited atop the original surface horizon.

We have more than 70,000 kinds of soil in the United States. It requires a scientist to identify many of them. But all of us can see some differences in color or texture.

Soil color comes from minerals or organic compounds in the soil material. Very generally speaking, red and red-brown colored soils are commonly found in the U.S. Southeast. Tan and light gray soils are often typical of dry-warm climates like the Southwest. Most dark-brown and black soils, indicating large amounts of organic matter, are found in the Midwest.

SOIL INCLUDES

minerals from rock fragments, dead and living organic material, water, and air.

Most soils are a mixture of sand, clay and silt. You can get a rough idea of the proportion of sand, silt, and clay in the soil of your own garden by putting a sample of your soil into a jar of water and shaking vigorously for a minute or two. When it settles, the sand drops to the bottom first, the silt next, and the clay last of all.

Another aspect of soil is its permeability, or how rapidly it transmits air and water. Soil permeability is important; if water drains too slowly, basements may become wet during rainy periods, and there may be difficulty with on-site sewage disposal. Some soils when wet become unstable and foundations of buildings shift and crack.

The best soil for most uses is one fine enough to hold moisture, but porous enough so that excess water can drain away. An example would be a permeable soil with well developed structure.

OUR WAYS OF LIFE

are strongly affected by the different kinds of soil. Corn and small grain are grown, for example, in the Midwest because the soil and the climate are favorable for growing such crops. Ranching is important in Montana and Wyoming because the soil and climate are suited to growing grass.

Our soils are as varied as our people. And, like people, we can give them "aptitude tests" to find out their abilities. This is called the soil survey.

Aerial photographs are made of the land to be surveyed. Then a soil scientist digs into the soil to study the different layers, soil texture, structure, permeability, acidity, and so on. Soil samples are sent to laboratories for further study. Soils are classified and named in a national scheme of soil classification so that a soil with similar soil properties will have the same name wherever it occurs. When the survey is finished, soil maps with explanations and interpretations are published. The information is then available to anyone who deals with the land.

Approximately 50 percent of cultivated land in the contiguous United States has been mapped. You can obtain more information about soils in your area from your local soil conservation district office, your State land grant college, or your county commissioner's office.

SOIL SURVEYS

help farmers decide what crops will do best on what soils, and the kind of soil and water management practices needed for the best results. They help local officials locate safe school sites and guide housing developers, city planners, and engineers in the selection of land for highway and building use.

Soil scientists have developed a land-capability system that groups the kinds of soil into eight classes for the common agricultural crops. Generally speaking, Class I is the best land, Class II the second best, and so on down to Class VIII land.

For example, soil conservationists generally feel it is safe to grow cultivated crops on only the first four classes of land, while soils in Classes V, VI, and VII may be used for grazing or for woodland production. These, of course, are only generalizations which may be modified by specific soil and climatic conditions.

The land-capability system helps farmers to understand and use their land wisely for cultivated crops. The kinds of soil are grouped in other ways for horticultural crops, range, forestry, and construction.

SO FAR

we've looked at how soil is formed and how the soil has influenced us. Now, let's look at two different soil problems and see how they might be solved.

First, suppose you are a young couple building a home in a New Jersey suburb. It's outside the limits of city jurisdiction, and there's no public sewer system and no modern building code covering the area.

Your house is built, a septic tank installed, and the lawn seeded, with the hope of grass by spring.

Spring comes, but no grass. Instead, the basement floods from spring rains, and the walls crack. Raw sewage backs up and won't flush away. More sewage surfaces outdoors. Your little girl becomes sick after making mud pies in the backyard.

Your dream home is a mess; you had forgotten to check the soil underneath.

What happened? And what can you do?

Well, the water in the basement comes partly because the house is built on soils with a seasonal high water table. The house foundation literally floats on a soupy soil, and the strain is cracking the walls.

The solution? You should have checked the water table during the wet season before you built. A soil scientist or a soil map would show you the location of the kinds of soil and advise against building on them. The contractor could have added some safeguards or changed the homesite -- but it's too late now.

So you, the homeowner, might install drainage tile around the foundation and put in a sump pump to pump out water and clean up the mess. It may cost more than a thousand dollars, but it could provide a partial solution. There is always a hazard that during some rainstorms the electricity might stop, and the pump can't operate. So the basement may still be useless for storage.

The cracked walls can be repaired, but they may crack again.

The backed-up sewage was the result of an impervious soil layer 3 feet below the surface of the soil in the yard. It acts like a slab of cement part of the year and the sewage can't drain. You need help, or the house will be condemmed as unsanitary.

There are several choices. You could move. But the cracks and the sewage problem make the resale value of your house very low.

You can relocate the septic-tank filter bed on better (i.e., more pervious) soils if you have some in your yard. You don't.

You can petition for city sewer lines; but this will take years, and you need immediate help.

So, you might have your sewage periodically pumped out and hauled away. It's expensive, but necessary. In the meantime, your children cannot play in the yard during the wet, springtime season.

Next, grass. The original surface soil was scraped off in building and not replaced. This left a poor clay subsoil in which grassroots can't get started. You might buy new topsoil and sod, pay for installation, and eventually get a lawn.

But, if you were this homeowner, your problems may still not be over. Perhaps one stormy night the whole house floods. It's in a flood plain, in the path of a major overflow.

This is the last straw. You may join with your neighbors to find out if there is anything you can do jointly. You may then discover that your entire area was soil surveyed years ago and information on the flood-plain conditions, high water table, and clay soils is all on record on the soil map. The record was never checked before your home was built.

Some of the homeowners may move and take a heavy loss. You may decide to stay and join your neighbors, the county government, and some civic groups to sponsor a flood control project for protection against future storms. You may also petition for city sewage service. Eventually, the sanitation service and flood-control project might be built, but it will take a number of years and increase your taxes considerably.

Of course, not all these things could happen to one couple. But these are all real problems and some of these incidents happen to real people almost every day of the year. Real people who often discover, the hard way, that soil problems are not limited to farmers.

MEANWHILE, FURTHER WEST

in Nebraska, there's a stock farmer who owns 640 acres of gently rolling plains. Most of his land is in grass for cattle grazing; about 100 acres are in wheat and sorghum, and the remaining few acres contain the house, barn and roads.

His area of Nebraska has heavy winds in winter and spring and an average rainfall of 17 inches.

This farmer has several problems. His grass is disappearing through overgrazing. His 100 acres of wheat and sorghum are not producing well because of low rainfall and wind erosion. When it does rain, it pours so hard the topsoil tends to wash off and silt up the stock ponds. Finally, this man has a mortgage on the place -- he's got to make more money.

How best to use his land?

First, he has to improve the grass and yet feed enough cattle to make money. He cuts his cattle herd by 15 percent. In this area, a calf or steer must eat about 12 pounds of grass to add 1 pound of beef. So, with more grass for each animal, the 400-pound calves begin weighing up to 450 pounds.

Then the stockman divided his grass pasture into 3 parts; he rests one part every season, giving the better grasses a chance to grow tall again. A stock pond at a remote corner of one pasture spreads out the cattle, so the grass is grazed more evenly.

He has two crop fields. He puts the sloping field back into grass for cattle. The grass cover will slow erosion.

The other cropland is good for wheat -- when he has enough rain. He can't increase rainfall, but he can conserve what he gets. So he terraces the land, alternates his crops yearly to increase soil productivity, and puts in grass waterways to take extra rain away after the thunderstorms.

To combat wind erosion, he keeps on a crop residue in wintertime and has a tree windbreak around his barn and house.

The results? His calves are 30 to 50 pounds heavier. He can afford to increase the number of cattle because his grass is better, and he has a new pasture from the old, sloping crop field. His wheat yields are steady and he has fewer gullies. He's making more money -- on a sounder land base.

Is the stock farmer the only one to benefit by this better use of soil? Hardly! Multiply this farm by thousands of other farms and ranches producing wheat, oranges, and other foods in the most efficient manner. The savings goes right into your refrigerator in the form of better food at lower prices. Americans spend a lower percentage of their take-home pay for food that people in any other industrialized country in the world -- and we are still able to help millions of hungry people abroad through our aid programs. This national wealth goes directly back to good land use and management.

It matters to all of us what a rancher in Nebraska or a farmer in Georgia does with his land. It should be a matter of reassurance to us that more than 95 percent of all farm and ranch areas in our country are in soil and water conservation districts.

The human spirit, and now the body, can soar into the atmosphere. But the substance of life itself remains with the soil. We live on it -- and off of it. Let us now <u>learn</u> about it.

- - - - -

RELATED QUESTIONS FOR DISCUSSION

1. Is a soil survey the same as the "soil test" you make yourself with a soil testing kit? No. That only gives a pH rating for soil acidity or alkalinity and information on plant nutrients. A soil survey is a study of surface and subsurface conditions, to a depth of around 6 feet. It identifies the various kinds of soil present and reveals such vital facts as how fast water moves through the soil and the susceptibility to erosion, slippage, swelling, and shrinkage.

2. Is it safe to build your house on a flood plain if there hasn't been any standing water there for a decade? No, because when new houses go up, and grading and paving change the runoff patterns upstream, even "safe" flood plains may go under water during periods of high rainfall.

3. Do you live in a soil conservaiton district? Where is the district office? If you do not live in a soil conservation district, how would you request help from one district on soils, flood prevention, and other conservation work?

4. Can you recognize good land practices -- contour plowing, strip-cropping, terracing, windbreaks -- as you drive through the countryside?

5. Can you recognize the results of poor land practices -- gullies on suburban lots, flooding of backyard streams, heavily silted lakes or streams (from upstream construction work) as you drive around suburban areas? Do you see such good land practices as silt traps on land under construction? Are you in a community which has a soil survey and which uses these surveys in planning for community growth?

WATER: ENOUGH FOR EVERYONE?

Every major river system is now polluted. Waterways that were once sources of pleasure are forbidden to human contact and objectionable to sight and smell.

Lyndon B. Johnson

I find the great thing in this world is not so much where we stand as in what direction we are moving.

Oliver Wendell Holmes

IN A WORLD

of many choices, we have no choice about water. We must have it for food, industry, and life itself.

Industry and agriculture are the biggest water users. But vast amounts are also used for sanitation, transportation, drinking, cooking, and washing, as well as for swimming and other forms of recreation.

This water is all used, but not necessarily consumed. The same water can make steel, produce electric power, grow corn, and enter a sanitation system if it remains clean enough for each use. Both the quantity and quality of water are important.

FIRST, QUANTITY.

The United States receives enough water, from rain and snow, to cover the land to an average of 30 inches. But, much of our country isn't "average." More rain falls in the eastern United States than in the western half.

As our forefathers went across the continent, east to west, they had to accept this fact of varied water supplies and adapt their farming methods, water laws, and ways of life to the new conditions. As an example of extremes . . . Death Valley, California, receives an average of about 2 inches of rain a year while parts of the Pacific Northwest are deluged with 142 inches.

Either too much water, or too little, can cause serious problems.

THE HYDROLOGIC CYCLE

is the eternal cycle by which water moves from earth to sky, then back to earth as rain or snow. Much of this cycle is invisible. We do see part of the pattern when it rains. Some of the falling rain evaporates from the ground and returns very quickly to the sky. Some runs downhill and across pavement to gullies and lakes and is used for industry, municipal water supplies, and so on. Other rainfall seeps into the ground and fills up air spaces in the soil. This latter is ground water -- actually, underground water.

The water table of an area is the top of the ground-water level. Water tables change throughout the year but are usually highest in the spring, from rain and melting snow.

Water tables can also change permanently when we use a great deal more ground water than nature can replace. This is happening in some of our water-short areas of great population growth.

Ground water supplies about 20 percent of the water we use; surface water, about 80 percent. Surface water is water that drains from the land into the area's streams and lakes. The land area from which the water drains to a given point is a watershed.

WATERSHEDS

come in all sizes and shapes, from the giant Mississippi River basin, or watershed, which drains water from nearly half of the United States, down to mini-watersheds of a few acres. Watersheds are the logical, geographical areas by which to deal with our water problems.

WHAT ARE

these water problems? Too much water. Too little water. And poor quality -- or polluted -- water.

Water shortages can mean droughts, dust storms, empty faucets. Historically, droughts were the concern of water-short western states, but today they can occur in all areas of the country.

Available surface water supplies can be increased by man-made reservoirs, by diverting water from water surplus to water deficient areas and -- this will probably increase -- by converting salt water to fresh water through desalting plants.

We can increase ground-water supplies by getting more water into the largest reservoir of all, the land. Farmers and ranchers do this

by a number of methods such as terracing the land, plowing on the contour, planting cover crops and using grass waterways. These methods all hold more rainwater on, and in, the land. This water is then available to the growing crops.

This helps farmers -- and farmers are major water users. But it also helps everyone else in the watershed. It means lower water levels during the flood-prone season, and this reduces the chance for flooded homes and businesses in the suburbs. It reduces the amount of water-carried silt that would otherwise clog up rivers, swimming lakes and man-made reservoirs.

Good land use, such as using terraces and contour plowing, doesn't add to the total amount of water in existence, but it does make it possible to use available water much more efficiently.

SOMETIMES THE PROBLEM

is not drought, but too much water, as in wetlands and floods.

Wetlands are areas with a high water table -- so high that it interferes with the use of that land for farming, housing, and industry. Wetlands can cause poor crops, flooded home basements, cracked building foundations, and so on. Wetlands can often be drained by ditches or through the use of underground perforated pipes or clay tiles -- but this may be expensive.

Some wetlands, especially true marshes or swamps, are better left undrained. They can be used by ducks and other wildlife and are good for hunting and tourist enjoyment.

Floods -- impermanently wet lands -- cause more than a billion dollars of damage a year in this country. The damage is widespread, but the first, and often the worst, hit are people living and working in flood plains.

Flood plains are land at the bottom of a stream valley. Flood plains are the areas designed by nature to take the overflow water -- the place where a rampaging river or stream can get the violence out of its system without causing further damage.

But -- ignoring nature's logic -- we often build homes, industries, and roads in a flood plain and destroy the drainage pattern. The cement-covered parking lots and building areas waterproof the ground, and the water no longer soaks in.

Sheets of water run off the concrete and into little streams that were never designed for all of this extra flow. The stream channels overflow and the area is flooded.

homes, and buildings flood-resistant requires a knowledge of drainage patterns and of how to safely change the natural drainage patterns when we use the land.

Let's see how three different kinds of watersheds can be made flood-resistant.

First, a tree-covered mountain-area watershed where the land is scarcely changed from its natural pattern. If the soil is normally well protected by a covering of grass and trees, most of the soil will remain in place when it rains. This is a nature-protected watershed.

Next, a watershed where most of the land is in farms. An agricultural watershed can be well protected if the farmlands are well managed. This may mean contoured or terraced fields, cover crops, or other conservation measures. Soil conservation experts point out that each piece of land is different and must have the right conservation "prescription"; but, in general, agricultural land can be made flood resistant if drainage is provided for and if the soil has some sort of protective covering.

Finally, a suburban watershed with homes, roads, and shopping centers. High-density land use like this generally perverts the natural drainage pattern a great deal so it is necessary to develop more elaborate counter measures to assure a flood-resistant area.

Land-wise developers should observe carefully the natural drainage pattern and keep it in mind in all subsequent planning. Obviously, they should not plan for high-density building in unprotected flood-plain areas. They should clear only the land they can build on immediately, as bare soil erodes quickly. They should leave as much vegetation as possible, as long as possible, on the land; when this is impossible, and the land must lie idle, they should put on a quick-growing, temporary grass and, if necessary, add debris basins to trap the silt before it runs off into the local streams and pollutes the downstream water supply.

After construction, the good developer sods quickly. If he has considered the natural drainage pattern . . . compensated for major deviations from this . . . and kept bare land to a minimum throughout the construction process, his area should be flood resistant. He has worked <u>with</u> the land even as he changed it. His homeowners and the people in the city downstream will all benefit.

Water pollution from silt is often a byproduct of poor farm and nonfarm use of the land. Studies around metropolitan Washington, D.C. show that silt from construction areas not using good land treatment can be 15 times higher than silt from nearby agricultural land.

WATER POLLUTION

is the third major water problem. The biggest (in volume) and one of the most expensive water pollutants is silt.

Silt doesn't smell as bad as sewage pollution, nor look as bad as industrial waste. But it runs up a yearly bill of more than 500 million dollars for dredging and other extra costs needed to provide us with clean water and an adequate water storage capacity.

Silt pollution is primarily controlled by treating the land correctly.

WE HAVE SAID

that the water problems of America are too much water, too little water, and water pollution.

These are immense problems. But sometimes the answer to a community's water problems can be found by the community itself, within its own small watershed.

The small watershed, as used here, means anything up to 250,000 acres, or about 390 square miles. Let's consider one small watershed -- that of Mountain Run, Virginia, and see what the people there did about their problems.

Culpeper, in the Mountain Run watershed, is a small, progressive Virginia town. But periodic floods washed away much of the progress. Year after year floods broke water mains, destroyed property, cut off water supplies to the town's industries. The same floodwaters washed over good farms, taking topsoil and ruining crops.

Between floods there were dry spells. Twice the town's main water source went dry. For 4 years in a row, the town needed emergency water supplies.

Something had to be done before Culpeper died from lack of water. Something was.

Town and farm leaders together with the local soil conservation district went to work. The surrounding farmlands were treated in a conservation manner (using some of the methods described in the flood-resistant agricultural watershed), and three small dams for flood control were built. One of the dams also held a half-year's municipal water supply.

Culpeper received planning, and some financial help, from the Soil Conservation Service; but two-thirds of the cost came from the local people.

The results?

Four new industries, with a thousand local employees, arrived after the town had an assured water supply.

Land that flooded periodically before is now protected and has become a shopping and housing area. The town's population has more than doubled.

Flooded farmlands in Culpeper county are no longer a major threat. More land can be used more often.

And, one of the dam-created lakes is also the center of a new recreation park.

All this, because the people in one small watershed understood their land and water problems of drought and floods and worked together intelligently to solve them.

WHAT, EXACTLY,

did Culpeper do? First, they stored up more water in the ground through conservation-farming methods. This reduced flood chances and meant more useful water.

Rainwater not stored in the ground was carried safely downhill through waterways and other means.

And, dams and other engineering structures helped store water and control its use.

Small watershed programs like this are in progress in more than 1,300 communities. They save millions of dollars in flood damages every year. Many of them also supply water for irrigation, domestic supplies, recreation, or other local needs. Most of them are in rural areas, but some of them affect large metropolitan areas, such as Washington, D. C., where soil conservation experts are working to help save beautiful Rock Creek watershed from flooding and siltation.

OUR WATER NEEDS

are rapidly increasing. Today, we use about 365 billion gallons of water daily. By 1980, we'll use an estimated 650 billion gallons a day.

Domestic water use has gone up four times this century; industrial use, up 11 times; irrigation, up seven times.

We have enough water -- if we use it well. Floods? Drought? We can control their effects to a large degree -- if we understand the land, the sources of water, and the changes we have made in both.

- - - - -

RELATED QUESTIONS FOR DISCUSSION

1. What is the major water problem of your area? Floods? Droughts? Pollution? Erratic water supplies? No water-based recreation?

2. Have you had recent floods or droughts in your area? What was done to alleviate them, and possibly prevent them in the future?

3. Have you noticed any water sources in your area that used to be clean and are now obviously polluted? For example, lakes with "no swimming" signs now posted? Heavily silted-up rivers with few or no fish? Muddy streams with caved-in streambanks? What caused these changes? New water uses -- a new industry, for example? (Of course, in areas that are prepared for the heavier water use, new industries need not cause these problems.) More people using the same amount of water? Building developments upstream that are sending down silt or changing the area's drainage pattern? Other reasons?

4. What is the source of your area's water supply?

5. In the opinion of area leaders, is your town's water supply adequate for the next 10 years? Is the water supply matched to the town's expected growth? Will another reservoir, or filtration plant, be needed in the next 10 years? If so, has a site been set aside?

WILDLIFE - WHO CARES?

It is the interdependence of all living things and their common relation to the physical environment that constitutes the scientific basis for conservation policies.

Dr. Rene Dubos

If we are creating an environment that is lethal to, say, a cardinal, then we should be warned, not so much for the cardinal's sake, as ours, that bad mistakes are being made someplace.

Dr. Raymond Johnson, Research Chief,
Bureau of Sport Fisheries and Wildlife

ECOLOGY --

"the study of the home" -- is the study of the intricate relationships between all living organisms, including you and me, and the physical environment that keeps us alive. Whatever changes we make in the environment will affect us. Sometimes, we make changes against our own best interests. These may result in accelerated soil erosion, water pollution, poisoned air.

Wildlife, like us, depends on land and water to live. Because we control land and water, we therefore control wildlife too. What you will be reading in the next few pages concerns not only wildlife, but all of us.

THE AMERICAN LAND

has changed tremendously since we became a country. Whole forests have been cut, prairies plowed, swamps drained, deserts irrigated. As a result, the numbers, types, and habitat of our wild animals have also changed. This is inevitable, since different types of land, and land uses, attract different types of wildlife.

EARLY WILDLIFE

in our country was abundant. Scientists believe we had, for example, at least 60 million buffalo, and as many beaver; 40 million antelope, ten million elk, and countless millions of passenger pigeons.

Today some early animals are extinct; some survive as protected species, and some are increasing. In addition, we have imported new species, such as the Hungarian partridge, the English sparrow, and the South American nutria. We have altered the ratio of one species to another, and we have changed the habitats of some birds and animals.

Who, or what, changed our wildlife?

Fur trappers and early hunters, through selective killing of certain profitable species, made some changes. Farmers and ranchers, through land changes which favored some wildlife and penalized others, made some changes. Urbanization -- land changes from low-density use, such as croplands, to high-density suburban buildings -- also changed the patterns of wildlife.

All in all, we probably have more wildlife today than we had 200 years ago. Some of it lives in parks, game refuges, and forests. But most wildlife today lives, procreates, and dies on farms and ranches.

FOOD CHAINS

Are one example of the interdependence of man, animals, and plants. A common food chain is man (who eats) domestic cattle (who eat) grass and grains (which grow from) soil, water, air, sun.

A simple wildlife food chain would be cougar . . . deer . . . buds and browse . . . soil, water, air, sun. Today, however, we have greatly reduced the number of cougar, through both direct and indirect means, so a more common food chain is man . . . deer . . . buds and browse . . . soil, water, air, sun. Sometimes, as in this example, we replace wildlife in a food chain.

In addition to direct killing, we also affect wildlife by competing with them for space and by using our land, air, and water for purposes which may help, or harm, our congeners. A polluted stream can kill fish and harm animals. Badly eroded lands will hasten the death or departure of wildlife. Polluted air has been known to kill birds, while some insecticides have been harmful to some animals

We are responsible for wildlife today because we control access to their three basic needs of good food, adequate cover, and clean water.

COVER

is home to wild animals. It's where they rest, hide, and raise their young. If the right kind of cover is removed, wild animals will either leave the area or find a substitute cover.

WATER

is necessary to all living things. Some animals also live, or nest, in water.

FOOD

is another basic need. The diet of young animals is often different from their diet as adults. Some animals, like us, eat both plants and other animals; others rely entirely on one source.

Most wildlife today finds its food on farms and rangelands -- not only grass and cultivated crops, but insects, mice, wild berries, and so on.

WHAT ATTRACTS WILDLIFE

to farms and rangelands? The availability of food, water, cover. Since modern conservation farming improves the land, it also improves the sources of food, water, and cover for many kinds of wildlife.

For example:

Strip cropping, or alternate rows of crops, is a basic conservation measure that helps the farmer. It also attracts about twice as many ground nesting birds, mainly because stripcropped fields have more edges, or areas where food and cover are close together.

Farm woodlots, and tree and shrub windbreaks, are a home for many kinds of birds and tree animals. Hedges and borders between fields, and between woodlands and croplands, provide food and safe travel lanes.

Farm ponds built for cattle and irrigation help wild animals too. Trees and shrubs planted along streambanks attract more wildlife. They also reduce stream siltation and this, in turn, means more fish and better fishing.

Many farmers save a small part of their land primarily for wild animals and plant special food crops to attract them. Other farmers leave a little grain standing in the fields to attract pheasants and other desirable species. Like all of us, farmers and ranchers enjoy wild birds and animals for many different reasons.

WILDLIFE -- WHO CARES?

Many Americans -- perhaps 25 to 30 million -- participate in wildlife-related recreation such as birdwatching and game hunting. Other millions have an aesthetic appreciation of the presence of wild birds and animals.

Some scientists believe one important value of wildlife is as a measure of what we are doing to our common environment. If sheep die from air-borne chemicals today, what will the same chemicals, in the air or in our vegetation, do to man tomorrow? If fish die from polluted waters, how will that water affect us? If what we are doing to our surroundings this year affects the weaker, less prepared inhabitants, it may be a warning to stop, look, and ponder the effect of our actions on ourselves.

Other considerations in preserving wildlife are: the value of some endangered species as part of our total "genetic pool"; preservation as a matter of basic morality; and finally the fact that we do not know all the consequences to ourselves and our world of exterminating some species and radically changing the numbers of other species. As rulers of the earth, perhaps we, the people, should learn more about the ecological rules that govern us all.

- - - - -

OUR CHANGING COUNTRYSIDE: AGRICULTURE

While the farmer holds title to the land, actually, it belongs to all the people because civilization itself rests on the soil.

Thomas Jefferson

OUR COUNTRYSIDE

is rapidly changing. Changes such as new suburbs and superhighways occur primarily near towns and cities. Other changes, just as important, are altering our agricultural lands.

What are these changes? Why are they happening? Who makes them?

OUR 50 STATES

contain 3,548,974 square miles of land. We use approximately:
33 percent of our land for wood and forest uses.
41 percent for pasture and range
17 percent for food and fiber production (cropland)
4 percent for cities, towns, and public facilities
3 percent for outdoor recreation (state and national parks, etc.)

In addition, about 12 percent of our land is nonproductive for most farm or city uses.

These figures total 110 percent. About 10 percent of our land is a mixture of forest and range or pasture. It's impractical to separate this acre by acre, so we have included -- or duplicated -- this 10 percent of double-use land in both the forest and pasture percentages.

FOREST OR WOODLAND

is used for timber, wildlife habitat, livestock grazing, and recreation. Alaska has a large forest area, as does the east coast mountain area, the North Pacific coast states and elsewhere. More than half of our commercial, or timber-producing, woodland is privately owned, mostly by farmers.

GRAZING

of livestock, on pasture or range, is our largest single land use. The Great Plains and Rocky Mountain states have the largest grazing areas, although pasture land is increasing in the Southeast.

CROPLAND

is planted, cultivated, and harvested land. This is where we grow wheat, corn, oranges, cotton, tobacco -- all of our food and natural fiber except animal products.

The figure of 17 percent is cropland used for crops. A higher percentage of land could be used, if necessary, but some of this potential cropland is now in woods or pasture, and it would take time and money to clear, drain, and otherwise prepare it for planting. These higher costs would probably be reflected in higher food costs for consumers.

Cropland is located in all parts of the United States. The largest single area now in use is in the North Central region -- Illinois, Iowa, and surrounding states.

OUTDOOR RECREATION LAND

includes state and national parks and the wilderness areas of national forests. In addition to "full time" recreation land, many farms and ranches provide outdoor sports such as pheasant hunting, fishing, and horseback riding on a commercial basis.

The growing popularity of outdoor recreation is putting more pressure on land planners to preserve green spaces near the newer suburbs.

URBAN LAND AND PUBLIC FACILITIES

includes cities, suburbs, roads, highways, utilities, airports, and military installations. More than a million acres a year go from rural to nonrural land use.

NONPRODUCTIVE LANDS

include bare, rocky areas, some swamplands, and similar lands. "Nonproductive" means the land has little value for normal agricultural or urban uses, but it may have spectacular scenery (i.e., the Grand Canyon) or other esthetic values that will "produce" money through tourism.

ONE FINAL THOUGHT:

The United States is large and varied enough to supply all the legitimate land needs of its people for food, homes, wood, and recreation. But -- and this assumes land planning -- the right land must be used for the right purposes.

LAND PLANNING

is done by land users, land owners, and community officials.

Real estate developers are de facto land planners. Federal and state governments plan for their land. Farmers and ranchers plan for the land they own or operate.

Eighty-one percent of our country is in agricultural or forest use. Farmers and ranchers plan the largest area of our land.

Modern farmers and ranchers no more resemble their predecessors of 100 years ago than do modern businessmen. Their new knowledge, seeds, equipment, and techniques have brought a new look to the countryside.

FOR EXAMPLE

some land once in cultivated crops, such as corn or cotton, has gone "back to grass," i.e., is now used for grazing sheep or cattle. This is often land that -- we know now -- should never have been plowed in the first place or became unsuitable for continuous plowing through serious soil erosion. You can see this land change in many areas of the Great Plains and the Southeast.

Other changes include . . . tree windbreaks in the tree-scarce plains . . . irrigation on arid or semiarid lands . . new farm ponds all over the country . . . contour stripcropping . . . and crop rotation.

Agricultural land planning -- the basis of these land changes -- is a complex business. It's based on a knowledge of soils and climate, of past land uses in the area, of market prices for possible crops, and of the owners personal farming or ranching preferences.

GROUP PLANNING

for basically rural areas is a new and exciting field. For example, over a thousand communities are now working on small-watershed projects. These two-fold projects combine land treatment with small dams to trap and control excess water. The land treatment and the dams will prevent floods and provide "captive" water for drinking, irrigation, or other community needs.

RESOURCE CONSERVATION AND DEVELOPMENT PROJECTS

are concerned with the future use of our natural resources in a larger, usually multi-county area. One RC&D project alone, for example, includes more than 8 million acres.

While RC&D projects are primarily in rural areas they cover both farm and urbanizing lands. They are a serious attempt by local people, with Federal and State help, to deliberately plan and develop the natural and other resources of their area in a desirable direction, rather than wait for it to grow "any which way". They are designed to improve the area's economy and to avoid the rural-into-suburban sprawl and poor land use that disfigures some of our countryside today.

WHO'S MINDING THE COUNTRY STORE?

Large projects like watershed planning and RC&D projects take time and effort and knowledge. Often, the leadership comes from people in the local soil and water conservation districts.

Soil and water conservation districts were born back in 1937 after our Nation had survived a drought and dust bowl and could see the need for better land planning. Today, through districts, more than 2 million landowners are working to improve their own land. Often, they help with land planning for their community as well. Districts cover 96 percent of the land area in farms. They contain the largest number of grass-roots land experts in the Nation.

THE BASIC PURPOSE OF CONSERVATION

is not more crops or livestock, but better use and care of the land. However, when land is well treated, it will usually produce more and be more efficient.

This efficiency means your food prices, versus your take-home pay, are the lowest of any developed country in the world.

But . . . problems in the use of land still remain . . . and may increase because our demands on the land are increasing. Some questions are:

1. Should we keep some good agricultural areas in agriculture by zoning and tax adjustments? Land is not interchangeable; what grows well in New Jersey may not grow at all in New Mexico. We cannot remove a thousand acres of land from agriculture in Maryland and substitute a thousand acres in Montana for the same agricultural purpose.

Much of our disappearing farmland grows specialty and table crops. California, with only 3 percent of our farms, provides over 40 percent

of our fruits and fresh vegetables. Yet, experts say new suburbs and highways may take up to half of California's best cropland in the next 15 years. Will we then continue to have "cheap" food? Would it be better to save some of our good agricultural land for food by zoning and tax laws that make agricultural use competitive with other land uses?

2. How can we take <u>out</u> of farming some land that should never have been used for crops at all without hurting the present owners?

3. How should we decide between various land uses if they are all desirable? Should good farmland at the edge of a growing city go into soybeans, suburbs, or a recreation park? What is the greatest need today; what in 20 years?

4. <u>Should</u> we plan for the future use of the land? Who should do the planning? Local communities? State or Federal agencies? Do we want an efficient, beautiful environment?

What is <u>your</u> answer?

- - - - -

RELATED QUESTIONS FOR DISCUSSION

1. Does your town, city, or suburban area have a planning commission or a comprehensive or master plan? How was it prepared? Is it being carried out?

2. If you live in the country, a small town, or a new suburban community, do you know if your area was ever soil surveyed? Were the surveys used in land use planning for your area?

3. Have you had the opportunity to visit a modern farm in the last 5 years to see how it's planned and operated? Sometimes local USDA county agents or SCS soil conservationists can arrange group tours.

4. Are you in, or near, an area with a small-watershed project, a resource conservation and development project (RC&D), or other land and water planning program? It might be interesting to visit and learn more about their aims and progress. Nationwide, there are more than 1,300 small watershed projects and more than 40 RC&D projects. Your nearest soil conservation district, or your local town or county government officials, can give you more information.

5. If you live anywhere except an older city, it might be interesting to trace the changing land uses in your county, community, or state during the last hundred years. Why did the "first families" of your area plant or build what they did on the land? How has the use of that land changed? Why? Some land changes come from technology (rapid transportation); some are social (the baby boom and the need for more housing); some are caused by special qualities of the land or area (spectacular scenery or an excellent climate for tourism); many come from changes in the land itself caused by our new knowledge (erosion control, irrigation, drainage, new crops, and methods of farming).

After noting the past changes . . . how do you think your area will change in the next 20 years? Do you approve or dislike what these changes will bring? Is there anything you can do about them?

OUR CHANGING COUNTRYSIDE: LAND IN TRANSITION

> *Three changing forces are bringing a new era to conservation. The first is growing population . . . the second is the triumph of technology . . . the third force is urbanization.*
>
> Lyndon B. Johnson

THERE IS A NEW AMERICA

every day. We see physical changes when vacant lots become shopping centers, farms become suburbs, and new multilane highways connect these lands in transition. We see social and economic changes as our population increases, our living standard rises, and our land and water base remains the same. We are a Nation that is growing and expanding -- in everything but our basic natural resources.

The implications of this are clear. We face new questions of resource priorities as our demands on the land increase.

WE NEED

from the land . . .
Food
Wood and fiber
Living and moving space
Recreation, and re-creation

These demands are increasing. At the same time, our land base for agriculture is decreasing, as 1 to 2 million acres of land go from farm to nonfarm uses every year.

Much of that land goes into new suburbs. It's estimated that within 30 years, more Americans will live in cities and suburbs than now live in the entire United States.

The popularity of outdoor recreation is also rapidly increasing. If we wish to have enough greenspace for parks close to our cities and suburbs, we must preserve that land now.

THE PRINCIPLES OF LAND USE PLANNING

can be capsuled in one sentence: use the land according to the people's needs and the land's capability. Consider all the major needs of the people in the area and all the possible, suitable uses of that land. Consider the needs today, and 25 years from today.

Land planners -- and this includes you and your local government -- should also remember these other points:

New land uses will affect older land uses, both physically and financially. A through highway in an established residential area will [very probably] affect the value and livability of the houses. Similarly, a new factory in a housing area may affect the desirability of that area for homes. A vacant lot that becomes a junkyard will downgrade an area, while former slums or auto graveyards that become parks or attractive housing areas will upgrade their surroundings.

New land uses also affect the natural environment of soil, water, plants, and animals.

For example, a large new housing development may be bulldozed clear of grass or trees and left bare for months or years before the buildings go up. Large amounts of the uncovered, unprotected soil will be carried, by wind or rain, into nearby streams and lakes as sediment.

This sediment -- perhaps thousands of tons -- can make mudholes of nearby lakes; it can raise the water level of little streams and contribute heavily to the debris and destruction of springtime floods in nearby suburbs. Silt and sediment from careless construction or farming methods can pollute drinking water downstream, kill fish, destroy the breeding grounds for ducks, and require expensive dredging operations for water purification, navigation, or recreation. Few people affected by all this will be aware of the fact that careless land use, miles away, is seriously changing their own land and water and increasing their tax assessments.

In land and water use, we should be aware that planned changes will also trigger other, largely unplanned, changes.

NEXT . . .

planners and community leaders should consider whether a particular land area can do double or triple duty. Often it can if the land use is not too intensive.

Cornfields can be used for pheasant hunting too -- if the farmer agrees. Growing corn and hunting pheasants are compatible uses.

Similarly, many forest areas can grow commercial timber and still be used for hiking and camping. And, man-made ponds can provide water for several purposes -- livestock, fire protection, swimming, boating, irrigation, and so on.

Third, good land use planning looks at the land itself. This sounds obvious, but it's often ignored.

For instance, people are still building or buying homes in unprotected flood plains even though this is the first area to flood. A well-informed citizen would build on higher ground. The unprotected flood plain could then be used by the community as a playground or ballpark since flood-caused damages for these uses would be less expensive to repair.

Of course, nobody expects the average homeowner to be a soils expert. But you might like to know that about a third of the United States has been soil surveyed by the U.S. Department of Agriculture and cooperating agencies. Soil maps, with explanations, are available to farmers, engineers, and others with a need to know. Soil survey information provides a starting point towards understanding your land.

The reason for understanding land is to use it better for <u>people</u>. So, of course, a community planner should know the needs of his community -- the needs both today and in 25 years.

Local officials responsible for planning should ask questions such as:

Do we need better planning in our residential areas?
Are we saving some of our scenic beauty?
Do we need more parks? More roads? Are we saving good reservoir sites for future water needs? As we pile more people in a smaller area, we must remember to provide adequate sewage disposal and water supplies.

<u>LOCAL OFFICIALS</u>

should look around for possible future trouble spots. Is the local lake becoming polluted or silting up and becoming a mudhole? Is too much good farmland going into housing, while other land -- as good for housing, not so good for farming -- stays idle? Is the community eating up its land and water resources too quickly? Special care should be given to those soil areas located in a favorable climate that produce special crops such as citrus, winter vegetables, etc. We do have a limited acreage of these soils in the United States.

Local officials should learn the answers while there's still time left to plan, because many rural-into-urban changes are relatively permanent.

A farmer, for example, might grow corn one year, rye the next, then use the same field to graze cattle. His uses are relatively flexible.

But, if a high-rise apartment is built on that former cornfield, the land use becomes relatively inflexible. The topsoil is removed, at least temporarily, and the subsoil is filled with underground wires, pipes, cement. The land itself is changed and it must now stay in urban use indefinitely because its potential as good farmland has greatly lessened, or almost entirely disappeared.

Let's remember to plan for all of our needs. Correcting mistakes later -- turning a flood-plain housing development into a park for example -- is always expensive and may be impossible.

WHO ARE LAND PLANNERS?

Farmers, ranchers, and other private citizens own or operate almost three-fourths of the land.

Federal, state, and local governments plan for national forests, state highways, city streets and parks, and so on.

But, few of us live on farms or in forests. Who plans for the land changes we see around our cities and suburbs?

Many people: home builders; road builders; industrial developers, and anybody else who controls land.

Sometimes, the edge of our cities becomes a kind of no man's, no-planned land where the ecological facts of life are ignored. Homes are built on unprotected flood plains. Sewage systems are put in soil that won't absorb the effluent. Large areas of ground are left bare for months or years and tons of silt and sediment go into the water supply of people downstream.

Fortunately, there's a trend toward more sophisticated land use in such "new towns" as Reston, Virginia, and Columbia, Maryland.

Reston planners, for example, wanted an attractive, functional, small city that would stay attractive. So they made a careful land use plan that included the following:

They built a 35-acre lake in a natural flood-plain area. Residents can swim or boat in their own backyard.

They put in a plant nursery that preserved thousands of trees and plants otherwise destroyed during building.

They sodded the area around homes very soon after building. This stabilized the highly erodible soils (on rolling land) and stopped potential gullies.

They put in a water-control system that included attractive concrete and rock-lined ditches and storm sewers, grass waterways, and irrigation.

Their outdoor recreation areas are well planned -- for example, their horseback riding paths in wooded sections are also fire trails, and their nature center for Reston children has special plants to attract birds and animals so the children can see wildlife in a natural setting.

Planning new towns, suburbs, and home developments <u>from the start</u> can prevent ugly scars and serious land problems for developers and their neighbors.

<u>WHAT ABOUT</u>

public planning for a county or other large area? First, of course, the people must decide what kind of community they want. Then, their plans must include the following:

1. Realistic facts and figures on the area's resources. This requires technical experts.

2. The understanding and support of its citizens. The plan will never get off the ground otherwise.

3. Vigorous administration by local government officials. The greatest blueprint in the world is no good if it only gathers dust in a back closet.

<u>SUPPOSE YOUR AREA</u>

has land and water problems . . . but no plan to meet these. Can you, a citizen, do something?

Yes. Especially if enough other citizens will join you.

An active civic group or service club may already be working on land use plans in your area. Does your county have a soil and water conservation district? A watershed-development group? A local community organization working on the problem?

All of these groups have led the way to better communities. Hundreds of them are doing so right now.

Here's one such group, and what they did.

In 1960, the Lake Barcroft Association (of Lake Barcroft Estates, Virginia) faced a critical problem. Real estate developments upstream from the area were pouring huge deltas of silt down into Lake Barcroft. The swimming beaches were disappearing and so were the property values. The pleasant, upper-middle-class suburb was locally referred to as "that mudhole."

Something had to be done. The association obtained approval for a silt dredging project. They raised the money, got the easements, and took care of all red tape. A dredge moved in and chewed away at the mud for about 2 years. In the process the lake was deepened, two silt traps were dug, an island was constructed from part of the material, and the rest was deposited elsewhere.

However, the land developers upstream were still at work, sending down silt from their bare-land subdivisions.

So the Lake Barcroft Estates Association established a small sanitary district that is now emptying the silt basins as they fill up.

Meantime, the citizens discovered other problems in their area, such as the serious drainage difficulties that came from lack of curbs and gutters. The association installed underground drainage in eroded ditches -- some of them deep enough to hold an automobile -- and planned an integrated improvement system including drainage, curbs and gutters, and new soil-cement roads. The program is designed by the association's consulting engineering firm, and the money comes from assessments and the county and state highway departments. The county and the local soil conservation district provide some technical help.

Stuart Finley, president of the Lake Barcroft Estates Association says, "Our community is no hotbed of do-gooders. But we did have problems, and we undertook to solve them. Hundreds of other communities could do the same."

WILL MANY PEOPLE

be as energetic as this group in working on their problems?

Yes, we think so. A cross section of adults were asked (in a Gallup poll) how many of them would work on problems in their community if they knew how.

Results from the poll indicate that a nationwide total of 61 million men and women are willing to volunteer 230 million hours of work a week. If all of this time and talent were applied, the results would match the total output of the auto, food processing, railroad, department store, and clothing industries combined.

OUR AMERICAN LAND

pioneering to the West is over. Today's frontier is our own community. The challenge is to improve life where we are. To clean the air. To clear the streams. To understand the earth and use it wisely for our many needs.

To use it for a better life for you and me, for our children, and for that extra hundred million persons who will join us in the next few decades on the American land.

RELATED QUESTIONS FOR DISCUSSION

1. What is the history of land planning in your community? Who made the plans? Are they on the shelf or in operation?

2. What was the population of your community in 1940? In 1960? Today? What are the predictions for 10 and 20 years from now? How much more land will be needed for homes, schools, parks, and roads in the next 10 years? (A well planned suburb needs about 15 percent of its gross area for schools and recreation, and another 15 to 20 percent for streets and roads).

3. Have land uses in your area changed a great deal in the past 10 to 20 years?

4. Does your community (farm or ranch area, small town, suburb, county) have a modern soil survey for land use planning? If so, was the information used?

5. What do you consider the most urgent (or potentially urgent) land and water problem in your area? The need for new building and health regulations? New zoning regulations or ordinances? Flood protection? More parks and outdoor recreation areas? Effective silt and erosion control measures? Others?

You might like to take a walk or ride around your area and spot as many kinds of erosion (and siltation) and unwise land use as you can. Are there gullies in the disturbed earth around a housing development? Erosion or cave-ins on individual lots? Sliding stream banks and silted-up streams? Hillside gullies down which soil washes after rainfall? Broken pavement (which could occur for a number of reasons, including the wrong soils); lawns where grass won't grow; septic-tank problems because of soil?

FOR FURTHER READING

Concepts of Conservation: A Guide to Discussion of Some Fundamental Problems. 64 pp. 1963. The Conservation Foundation, 1250 Connecticut Ave. N.W., Washington, D.C. 20036. (Single copies free.)

Conserving American Resources. Rueben L. Parson. 2nd ed. 544 pp., illus. 1964. Printice-Hall, Inc.

Ecology: Life Nature Library. Peter Farb. 192 pp., illus. 1963. Time, Inc.

Land for Americans. Marion Clawson. 141 pp. 1963. Rand McNally & Co.

The Land Renewed. William R. Van Dersal. 144 pp., illus. 1967. Henry Z. Walck, Inc.

Land Use Principles: A Reading and Discussion Guide. Ben Osborn. Graduate School Press, U.S. Department of Agriculture, Washington, D.C. $1.25.

Living Earth. Peter Farb. 177 pp., illus. 1959. Harper & Row. (Also available in paperback: Worlds of Science, Pyramid Publications. $0.65.)

The Living Landscape. Paul Sears. 199 pp., illus. 1966. New York Basic Books. (Previous edition in paperback: Where There Is Life. Dell. $0.50.)

Making Rural and Urban Land Use Decisions. Soil Conservation Society of America, Ankeny, Iowa. $0.75.

Mr. Planning Commissioner. Harold Miller. Public Administration Service, 1313 - 60th St., Chicago, Ill. 60637. $1.00.

Soil Surveys and Land Use Planning. Soil Science Society of America, and the American Society of Agronomy, 677 S. Sego Road, Madison, Wis. 53711. $2.00.

The Soils That Support Us. Charles E. Kellogg. 370 pp., illus. 1941. The Macmillan Co.

Water: Life Science Library. Luna B. Leopold, Kenneth S. Davis, and the editors of Life. 1966. Time, Inc.

Water for America. Edward H. Graham and William R. Van Dersal. 112 pp., illus. 1956. Oxford University Press.

The Web of Life. John H. Storer. 144 pp., illus. 1953. Devin-Adair Co. (Also available in paperback: Signet Key, New American Library of World Literature, $0.60.)

Wildlife for America. Edward H. Graham and William R. Van Dersal. 112 pp., illus. 1949. Henry Z. Walck, Inc.

Soil Conservation Service Publications

Single copies of the publications listed here are available free on request. They may be obtained from the field offices of the Soil Conservation Service (SCS), from Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250, or from Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250

Conservation and the Water Cycle, AIB 326

Early American Soil Conservationists, MP 449

Facts about Wind Erosion and Dust Storms on the Great Plains, L 394.

Know the Soil You Build On, AIB 320.

Know Your Soil, AIB 267.

Making Land Produce Useful Wildlife, F 2035.

More Wildlife Through Soil and Water Conservation, AIB 175.

Our American Land, AIB 321.

Sediment--It's Filling Harbors, Lakes and Roadside Ditches, AIB 325.

Soil Conservation at Home,AIB 244.

Soil Conservation Districts: What They Are, How They Work, How SCS Helps Them, PA 417.

Soil Erosion, the Work of Uncontrolled Water, AIB 260.

That Land Down There, AIB 255.

Water Facts, PA 337.

What Is a Farm Conservation Plan? PA 629

What Is a Ranch Conservation Plan? PA 637.

The following books and publications may be ordered from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402

Community Action for Natural Beauty. The Citizens' Advisory Committee on Recreation & Natural Beauty. $0.40.

The Why and How of Rural Zoning, AIB 196. $0.40.

Zoning - an Aid to Community Resource Development, PA 814. $0.15.

U.S. Department of Agriculture Yearbooks,

A Place to Live.	1963.	$3.50.
Land.	1958.	$2.25.
Soil.	1957.	$2.25.
Water.	1955.	$2.00.

Photographs

A set of 52 color lithographs of America, one from each state, plus Puerto Rico and the Virgin Islands -- is available from the Superintendent of Documents, Government Printing Office, Washington, D. C., 20402. Each picture is 20 by 24 inches and suitable for framing. Cost, $5.00.

Slides

The same 52 scenes are available in 35mm slides from the Photographic Division, United States Department of Agriculture, Washington, D. C., 20250. Price, $6.50.

Motion Pictures

This is a partial listing of USDA soil and water conservation films. If you are interested in borrowing a film, write to the Motion Picture Service, Office of Information, United States Department of Agriculture, Washington, D. C. 20250.

1. From the Ground Up. Color, 13 minutes. Explains the work of soil surveyors.

2. From the Ridge to the River. Color, 26 minutes. The story of local watershed organization.

3. Friendly Waters. Color, 6-3/4 minutes. Shows flood conditions in the Southwest, and some flood prevention measures taken.

4. We Share This Land. Color, 14-1/2 minutes. Wildlife on the land.

5. Our Land -- Its Many Faces. Color, 14 minutes. A look at the varied and beautiful faces of America.

6. New Life for the Great Plains. Color, 13-1/2 minutes.

7. Agriculture, USA. Color, 29 minutes. A panoramic view of American agriculture.

8. New Patterns on the Land. Color, 13-1/2 minutes. A filmograph showing the varied patterns of American land use.

- -

An interesting and educational view of urban erosion and sedimentation is shown in Mud, a 16mm color film produced by Stuart Finley Incorporated, 3428 Mansfield Road, Falls Church, Virginia 22041. This subject is not covered in any existing USDA film. For further information, contact the producer.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1968—343-492/SCS-33